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NOVAYA ZEMLYA, A RUSSIAN ARCTIC LAND

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INTRODUCTORY AND HISTORICAL

The twin islands of Novaya Zemlya, curving like an immense arc from northwest to northeast, stretch northwards for no less than 1,000 kilometers into the Arctic Ocean, west of the point where European Russia touches Siberia. It was the efforts to find the northern sea passage to the rich countries of the East that led the first Western Europeans to Novaya Zemlya in the sixteenth century. The way to the White Sea and the mouth of the Dvina having been found by Chancellor on Sir Hugh Willoughby's well-known expedition in 1553,[1] the English Muscovy Company in 1556 sent out another expedition led by Stephen Burrough, who had taken part in Chancellor's voyage, with instructions to find his way to the Siberian rivers. He did not achieve this object but penetrated as far as the Kara Strait and the southern part of Novaya Zemlya. Nevertheless, Burrough cannot be called the discoverer of these islands, as they were already known to the Samoyeds and hunters of Northern Russia, who called them Novaya Zemlya, i.e. the New Land. During the last decade of the sixteenth century the Dutch began their voyages in the northeast. In 1596 Willem Barents' last and most famous voyage took place, on which occasion he first rediscovered Spitsbergen and then sailed round the northern cape of Novaya Zemlya. Afterwards, however, his ship was caught in the ice, and he had to winter on the east coast at about latitude 76° 15′ N. As is well known, Barents himself never returned. He died from illness, but his men, after an adventurous voyage, finally reached Kola in northern Russia in the ship's boats.

During the seventeenth century several important Dutch and English expeditions explored the seas around Novaya Zemlya, and well on in the

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[1] Willoughby has been accredited with sighting Goose Land, the westernmost part of Novaya Zemlya, but Nordenskiöld does not consider this probable (The Voyage of the Vega, London, 1881, Vol. 1, p. 62).

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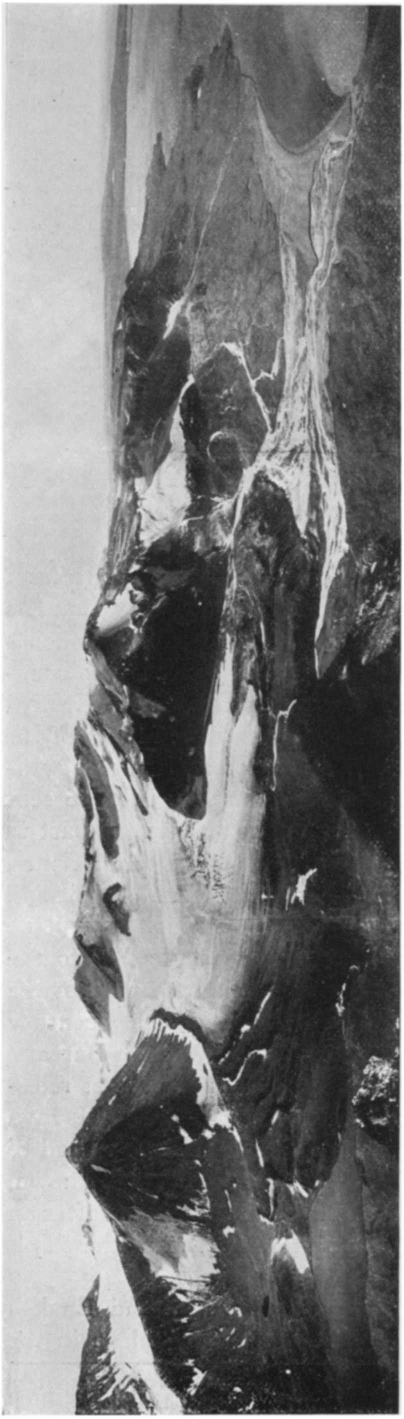

FIG. 1—Panorama from the southern side of Mashigin Fiord, western coast of Novaya Zemlya, at an altitude of 2,300 feet above sea level. (Photograph by R. Lund.)

eighteenth century the Russian explorations began. Of these the best known are Loschkin's and Rosmysslov's voyages about 1760. The latter explored the Matochkin Shar, the long winding sound which severs the country into two parts. But it was not until 1820 that the Russian authorities took up the exploration of Novaya Zemlya in earnest. Lieutenant (afterwards Admiral) Lütke investigated and mapped roughly large areas of the west coast in 1821–1824. Important geographical investigations were carried out on the east coast in 1832–1835 by Pakhtusov, the last two years in conjunction with Zivolka. Since that time the islands have been visited by numerous expeditions, both Russian and others, but it would carry us too far to take up in detail these more recent explorations. A great many European nations have at one time or another contributed to the work,[2] and I may mention that an especially important contribution to our knowledge of the northernmost part of Novaya Zemlya has been given by Norwegian sailors, who in their small sailing vessels have made numerous voyages in these waters, especially in the years about 1870, for seal, walrus, and polar bear hunting.

In spite of these explorations, however, Novaya Zemlya is still in many respects a little-known region. The east coast of the northern island, where, even in summer time, the drifting ice makes navigation especially difficult, is in every respect very little known, even from a purely geographical point of view. Not even the main features of the coast line are known. Detailed and correct maps are entirely lacking for practically the whole country; those which exist are mainly sea charts, including only a few limited areas, mostly on the southern island, principally near the Samoyed colonies.

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[2] See for example Charles Bénard: Dans l'Océan Glacial et en Nouvelle Zemble, Paris, 1909 (list of chief expeditions on pp. 189–190,) and *idem:* Un été chez les Samoyèdes, Paris, 1921, reviewed elsewhere in this number of the *Geographical Review.*

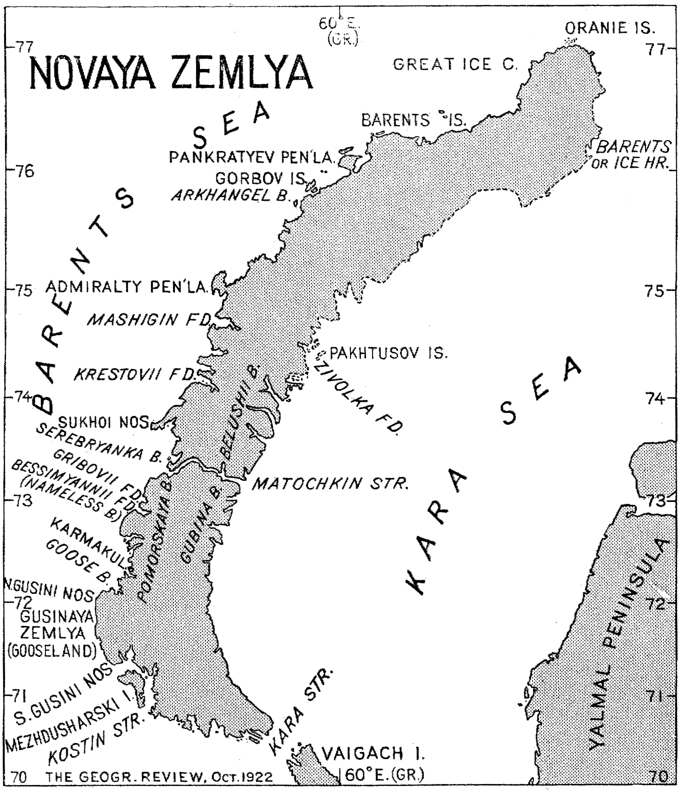

FIG. 2—Outline map of Novaya Zemlya

GENERAL GEOGRAPHY AND PHYSIOGRAPHY

Novaya Zemlya is divided into two islands by the narrow Matochkin Strait. This dividing line, however, does not in any way signify a boundary between two areas of different character. The country just north of the sound, and that south of it, are in every respect identical both as regards surface formations and geology, and Novaya Zemlya may be regarded as a geographical unit. Stretching from latitude 70½° to 77° N. the island exhibits wide differences in the south and north, as regards the ice covering. There are also considerable differences in altitude. Novaya Zemlya is the remnant of an ancient mountain range folded up in Permian time. To a great extent the same geological strata run lengthwise through the country, but the exposure of the several series of strata varies, and, as the various rocks weather very differently, we have a varied relief.

The middle part of the southern island shows a comparatively low, yet broken relief developed on strata of shale alternating with sandstone, a formation referred to as Permo-Carboniferous by the Russian geologist M. Chernyshev who in 1895 made a cross-country journey a little north of the 72nd parallel. A great part of the surface is less than 300 meters above sea level, and the greatest altitudes probably do not here exceed 500 meters. The low-lying Goose Land, the broad peninsula forming the westernmost part of Novaya Zemlya, has an average elevation of less than 70 meters above sea level. It is strewn with numerous large shallow lakes.

Both south and north but especially north of this middle area of the southern island we meet with higher country. To the south-southeast of Kostin Shar rise ridges that probably attain heights of 600–700 meters, whilst in the north, towards the Matochkin Strait, altitudes of 1,000 meters and over are found. These higher areas consist of a series of harder rocks, sandstones, quartzites, conglomerates, and dolomites which in part belong to the uppermost Cambrian,[3] in part to the Devonian, while in an extreme western belt are Carboniferous limestones. Chernyshev described a comparatively well defined boundary, along a line of faulting between the mountainous area near Matochkin Strait and the lower land to the south. In reality, however, no such fault seems to exist, and there is a gradual change in the landscape, which rises regularly to the north.

Between 73° and 75° there is along the west coast a strip of low, flat land sometimes as much as 10 kilometers in breadth and less than 100 meters in height. This strip—and no doubt Goose Land too—corresponds to the coastal plain, *strandflaten*, of Norway and Spitsbergen, cut by marine erosion at a time preceding the last complete glaciation of the islands. From this plain sharply defined mountains rise abruptly up to the height of 700–1,000 meters—probably nowhere exceeding 1,100 meters. Such elevations are maintained to about halfway across the island where the mountains gradually become lower, until near the east coast they give way to plateau-like landscapes, with altitudes of 300–500 meters. It is in these middle latitudes that we find the most typical fiord topography, with narrow fiords reaching from 30 to 40 kilometers inland. On the softer rocks of the mountain slopes we find a characteristic development of beautifully defined raised beaches, terraces cut in the shore line during a late Quaternary submergence of the land. The highest terrace that is undoubtedly marine lies 200–240 meters above sea level, the difference in different places being due to an uneven raising of different parts of the land mass. That these terraces represent old beaches is proved also by the occurrence of marine mollusks at corresponding heights. At Archangel Bay shells were found at a

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[3] The recent examination of the paleontological material collected during the Norwegian expedition has shown the rather unexpected fact that the oldest Paleozoic formation is represented in Novaya Zemlya.

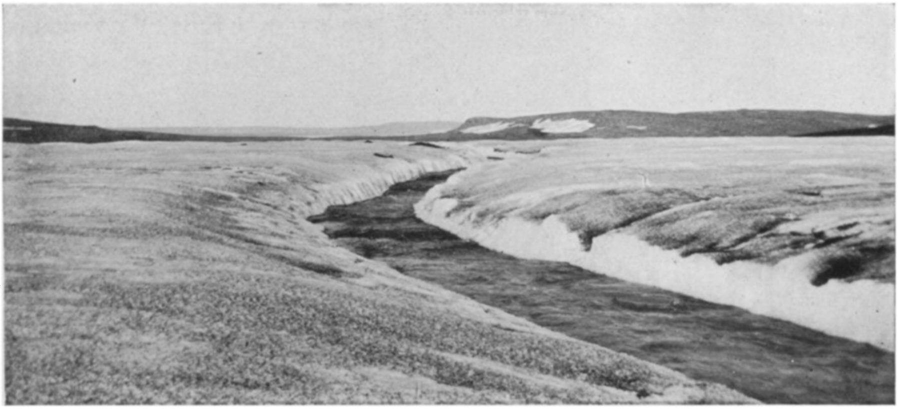

FIG. 3

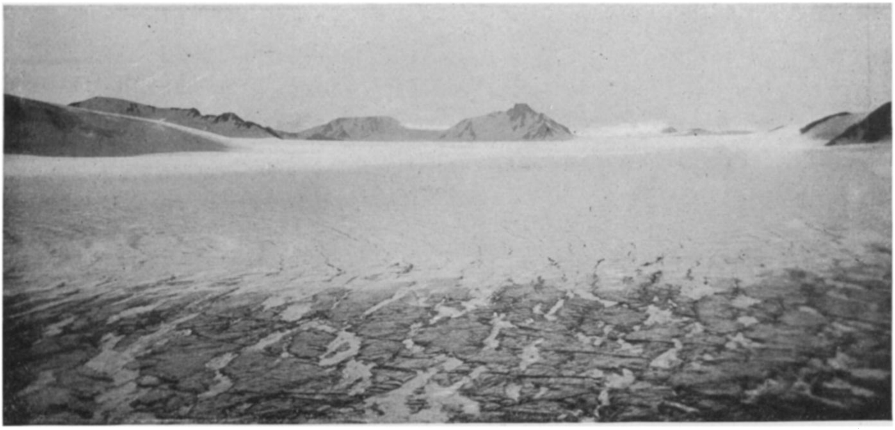

FIG. 4

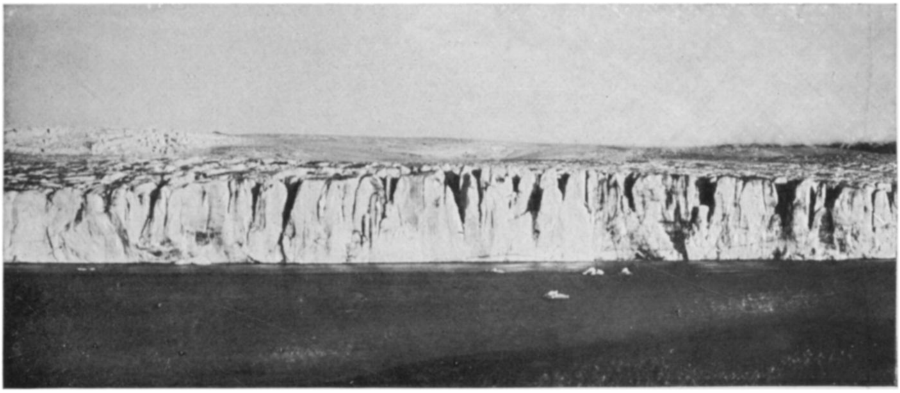

FIG. 5

FIG. 3—River on glacier on the Gorbori Islands, northwestern coast of Novaya Zemlya. (Photograph by O. T. Grönlie.)

FIG. 4—Glacial plateau about 1,650 feet above sea level north of the inner part of Mashigin Fiord. In the foreground the snow has melted, exposing the old dark ice. (Photograph by O. T. Grönlie.)

FIG. 5—Front of glacier (height about 100 feet) on the southern side of the narrow inner part of Mashigin Fiord. (Photograph by R. Lund.)

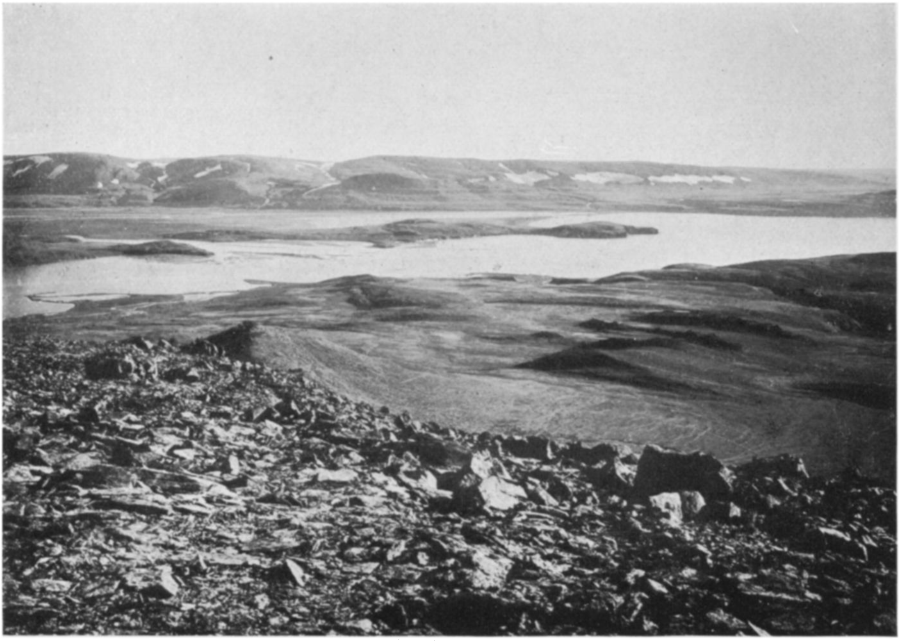

FIG. 6

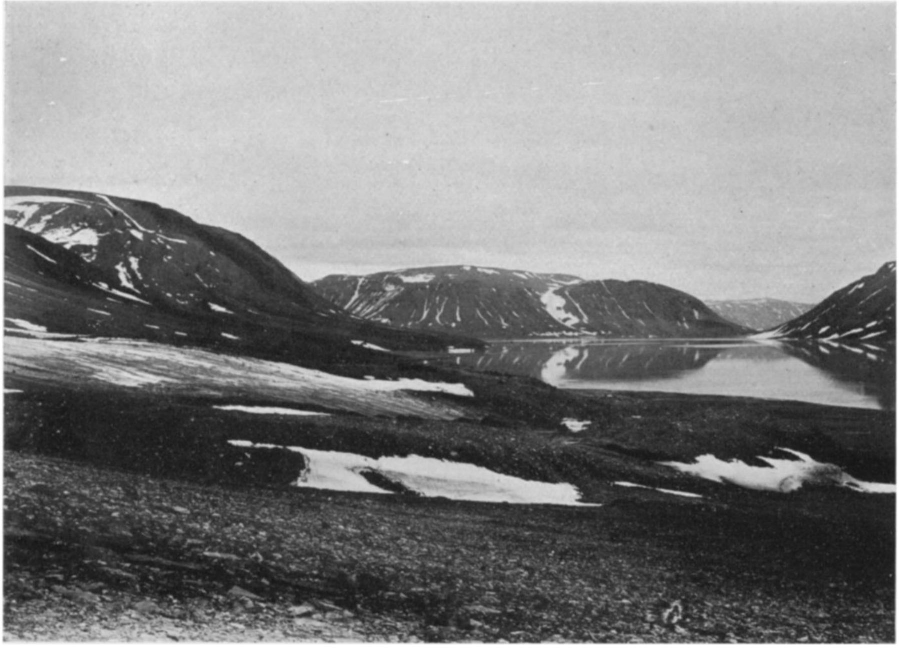

FIG. 7

FIG. 6—The innermost part of Bessimyannii Fiord (Nameless Bay), western coast of Novaya Zemlya. Note the raised beaches on the fiord walls and the widespread delta deposits. (Photograph by R. Lund.)
FIG. 7—The middle part of Matochkin Strait, the channel dividing Novaya Zemlya into two islands. (Photograph by B. Lynge.)

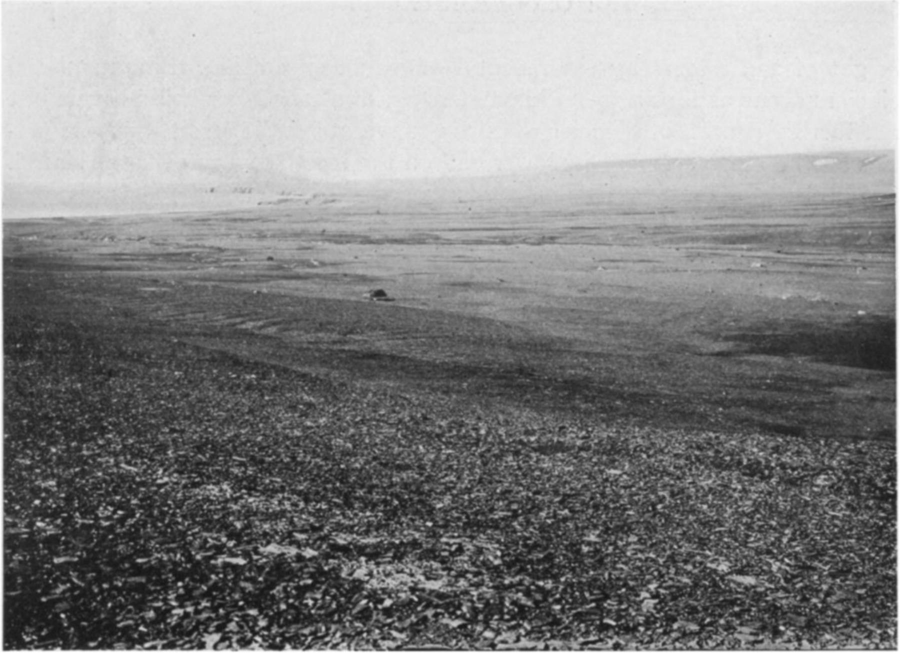

FIG. 8

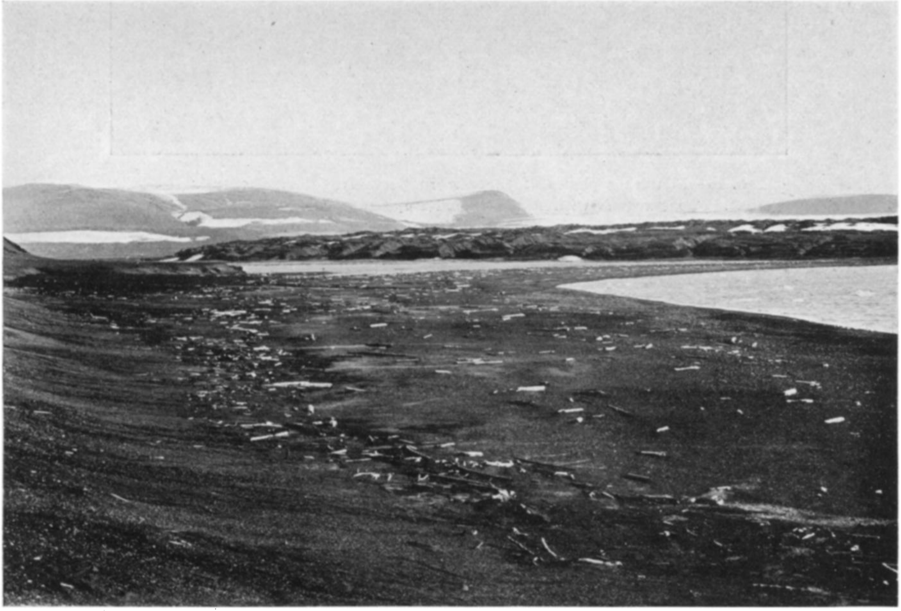

FIG. 9

FIG. 8—An Arctic desert. The southern side of Pankratyev Peninsula, northwestern coast. The cliffs defining the coast line are 30 to 60 feet high. (Photograph by B. Lynge.)

FIG. 9—Driftwood along the inner part of the bay on the southern side of Pankratyev Peninsula. Raised beaches at several levels are cut in the moraine hills in the background. Beyond is the inland ice. (Photograph by B. Lynge.)

height of 239 meters by the recent Norwegian expedition. Small isolated glaciers occur as far as 30–40 kilometers south of the Matochkin Strait but not farther south. No glacier reaches the sea along the strait, but one glacier on the north side has its lower end on the lowland very near the sound. From about 74° northwards glaciers reach the inner ends of the fiords, and their dimensions constantly increase northwards. On a sledge trip from the Mashigin Fiord to the Zivolka Fiord on the east coast, I crossed from coast to coast on glaciers whose surface was generally less than 400 meters above sea level.[4] Inland at these latitudes there is more ice surface than rock.

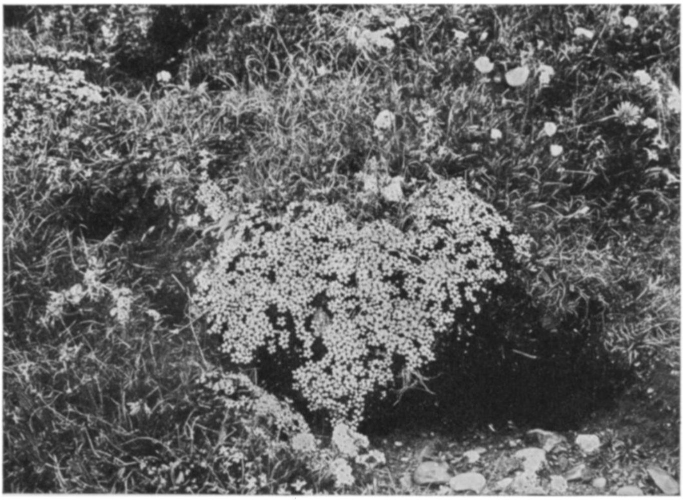

FIG. 10—Flowering plants of the eastern part of Matochkin Strait (latitude 73°N.). *Silene acaulis* with *Myosotis* and *Papaver*. (Photograph by B. Lynge.)

Farther north, the glaciers become still more dominant, and at 76° we may speak of inland ice. Practically speaking, the mountains rise above the ice only near the coasts. The ice there also forms an integral part of the coast line. The western coastal mountains north of 76° occasionally rise to 1,000 meters but are most often considerably less.[5] Concerning the east coast exceedingly little is as yet known.

BIOLOGY

The fauna and flora of Novaya Zemlya are in general very like those of Spitsbergen. The reindeer, which was formerly fairly common, is now mainly found along the east coast; and where the ice lies close to the shore the polar bear often lands. The polar fox also is rather common. Of smaller mammals there are species of lemming. In the fiords and on the ice near the coast we meet various species of seal (especially *Phoca barbata* and *P. foetida*) in great number, and on the east coast also the walrus. The white whale (*Delphinapterus leucas*), which was formerly very common, is still seen along the shores.

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[4] Olaf Holtedahl: A Crossing of Novaya Zemlya, *Geogr. Journ.*, Vol. 59, 1922, pp. 370–375.

[5] Cf. the map made by Lieutenant Sedov's Wintering Expedition 1912–1913, published in L. Breitfuss's article on the expedition in *Zapiski po gidrografii*, Vol. 42, 1918, Petrograd.

As in other Arctic islands, the main characteristic of the higher fauna is the bird life.[6] Geese of several species are seen in enormous numbers in the lowlands, especially on the southern island, eider-ducks are very common, and there are innumerable precipitous cliffs where thousands of looms (Brünnich's guillemots, *Lomvia bruennichi*) and various species of gulls (especially *Rissa tridactyla* and *Larus glaucus*) have their breeding places. There is also an abundance of smaller birds, among others several species of stints (*Tringa*) and the snow bunting (*Plectrophenax nivalis*), the latter being the most common land bird seen. Of larger land birds might be mentioned the snowy owl (*Nyctea scandiaca*). On the southern island Bewick's swan (*Cygnus bewicki*) is found. The rivers and lakes generally are poor in animal life, but a fine species of salmon, *Salmo alpinus*, occurs fairly commonly in some of the fiords of the western coast and enters the rivers there. At first sight insect life appears to be meager, nevertheless the number of species has proved to be very great; of one group alone, beetles, the Norwegian expedition last summer found some twenty species.

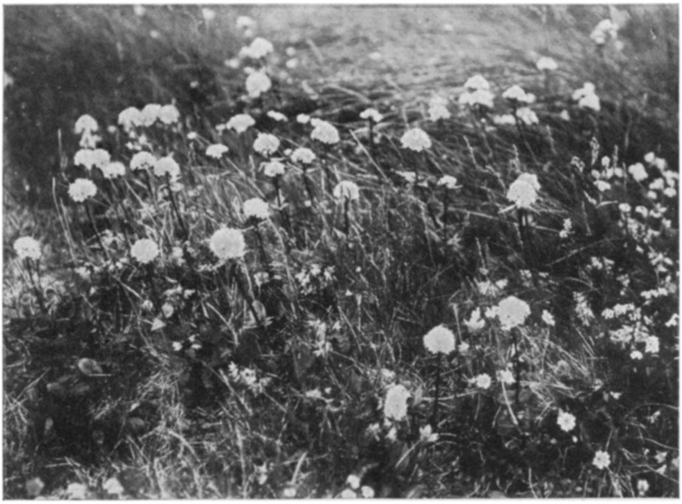

FIG. 11—Flowering plants at Serebryanka Bay, north of the western end of Matochkin Strait. *Valeriana capitata* and grasses.

No trees nor erect bushes are to be found even on the southern island, yet flowering plants occur in fairly large numbers. A total of about 150 species has been found in the southern island. This number decreases farther north.

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[6] Compare A. H. Markham: A Polar Reconnaissance, London, 1881, p. 151, and H. J. Pearson: Beyond Petsora Eastward, London, 1899.

Dr. Lynge, the botanist of the Norwegian expedition, found about 60 species on the west coast at about latitude 76°. Among the most common higher plants are species (about 10 in number) of Salix, their thin branches always creeping along the ground; also Saxifraga is represented by an equally large number of species.[7]

Nevertheless, there is an abundance of tree trunks to be found along the coast, carried there by the ocean currents chiefly from the Siberian estuaries. This Siberian timber has drifted a long distance before stranding here. It passes south of Franz Joseph Land, then drifts southwestward towards Bear Island, where it is caught by a drift from the Gulf Stream, the North Cape current, and carried along the Novaya Zemlya coasts. Incidentally it may be remarked that to this warm current is due the circumstance that the greater part of the west coast in most years is fairly free from ice during late summer and early autumn; and it is this current which makes possible such a comparatively rich vegetation.

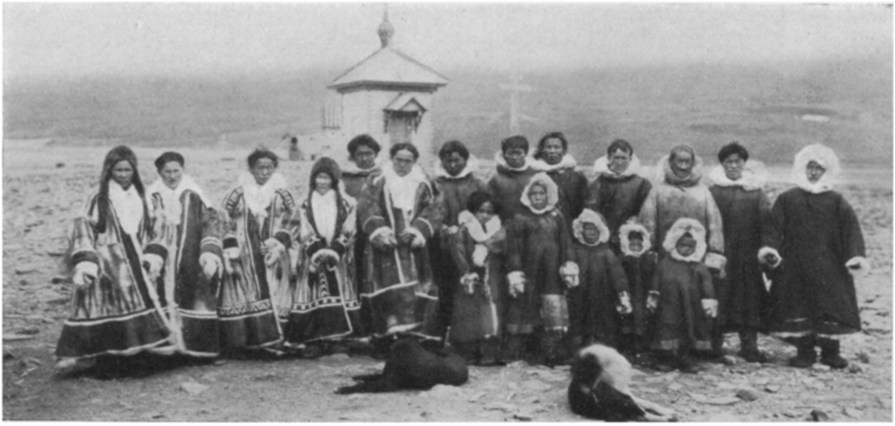

FIG. 12—The Samoyed colonists at Pomorskaya Bay, western end of Matochkin Strait. The little church in the background. (Photograph by R. Lund.)

THE SAMOYEDS

Before 1870 Novaya Zemlya had no permanent inhabitants, whilst on the mainland to the south and on the island of Vaigach reindeer-keeping Samoyeds led a nomad life. On account of the length of time the northern coast of Russia remains icebound the riches of the sea near Novaya Zemlya were utilized more by Norwegian sealers than by the Russians. It was to remedy this state of affairs that there was started, by the initiative of the Grand Duke Alexis Alexandrovitch, a colonization of the southern island. In 1877 five Samoyed families, numbering in all 24 persons, were transported from the Russian mainland, from the Mezen district on the east side of the mouth of the White Sea, to Little Karmakul on the west coast of the southern island, somewhat to the north of Goose Land. Later on other families joined the first.[8] Some of them soon moved north to the entrance of Matochkin Strait (Pomorskaya Bay), where there were better opportunities for hunting polar bears. In 1897 a third colony was founded at Belushii Bay on the southern side of Goose Land, and finally a small colony has come into being in the inmost part of the Krestovii Fiord. Personally I have seen only the last-named and the colony at Pomorskaya Bay, and in both places there are but a small number of persons, in the Krestovii Fiord about 10 and at Pomorskaya about 30, children included. The more southern colonies are larger, and here Russian priests are stationed.

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[7] A description of the flowering plants of Novaya Zemlya is given in the appendix by Col. H. W. Feilden to H. J. Pearson's "Beyond Petsora Eastward," London, 1899.

The Samoyeds live in solidly-built wooden houses, the material of which has been brought over from Russia. They live chiefly by hunting and salmon fishing and also receive every summer (in exchange for their furs) some provisions, more especially flour, sugar, tea, tobacco, arms, and ammunition, and other articles from Russia. Supplies, it may be noted, were received last summer. The Samoyeds wear garments of reindeer skin for the most part, though the women have bright-colored materials imported from the south for their "Sunday" clothes. They do not keep tame reindeer, but on the other hand they have a large number of dogs, which they employ to draw their light sledges. For a large part of the year the men are out hunting, taking with them their families and living in tents.

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[8] See the account of the settlement made in 1894 by A. P. Engelhardt, Governor of the Province of Archangel, described in his book "A Russian Province of the North," London, 1899, pp. 198 *et seq.*